

OBSERVATIONS & RECOMMENDATIONS

After reviewing data collected from **LAKE SKATUTAKEE** the program coordinators recommend the following actions.

FIGURE INTERPRETATION

- Figure 1: These graphs illustrate concentrations of chlorophyll-a in the water column. Algae are microscopic plants that are a natural part of lake ecosystems. Algae contain chlorophyll-a, a pigment necessary for photosynthesis. A measure of chlorophyll-a can indicate the abundance of algae in a lake. The historical data (the bottom graph) show a *fairly stable* in-lake chlorophyll-a trend. Chlorophyll concentrations were consistent with last season's results. A slight increase has occurred since 1997, however, mean values have remained well below the NH mean reference line for over 10 years! The slight increase in algal abundance in August was most likely caused by an increase in phosphorus concentrations. While algae are present in all lakes, an excess amount of any type is not welcomed. Concentrations can increase when there are external and internal sources of phosphorus, which is the nutrient algae depend upon for growth. It's important to continue the education process and keep residents aware of the sources of phosphorus and how it influences lake quality.
- Figure 2: Water clarity is measured by using a Secchi disk. Clarity, or transparency, can be influenced by such things as algae, sediments from erosion, and natural colors of the water. The graphs on this page show historical and current year data. The lower graph shows a *stable* trend in lake transparency. Lake transparency was slightly lower in August due to the chlorophyll-a and phosphorus concentrations being higher at that time. Mean transparency values remain below the state mean. The 2000 sampling season was considered to be wet and, therefore, average transparency readings are expected to be slightly lower than last year's readings. Higher amounts of rainfall usually cause more eroding of sediments into the lake and streams, thus decreasing clarity.
- Figure 3: These figures show the amounts of phosphorus in the epilimnion (the upper layer in the lake) and the hypolimnion (the lower layer); the inset graphs show current year data. Phosphorus is the limiting nutrient for plants and algae in New Hampshire waters.

Too much phosphorus in a lake can lead to increases in plant growth over time. These graphs show a *fairly stable* trend in the upper water layer, and a *generally improving* trend in the lower water layer. The lake was not stratified in July so only one sample was collected. Epilimnetic phosphorus concentrations were elevated in August possibly as a result of recent rains, which could have washed excess phosphorus into the lake through watershed runoff. This elevation in August led to a slight increase in algal growth during that time. Hypolimnetic phosphorus concentrations were above average for the lake, and slightly above the state median. We hope to see concentrations return to normal next season. One of the most important approaches to reducing phosphorus levels is educating the public. Humans introduce phosphorus to lakes by several means: fertilizing lawns, septic system failures, and detergents containing phosphates are just a few. Keeping the public aware of ways to reduce the input of phosphorus to lakes means less productivity in the lake. Contact the V LAP coordinator for tips on educating your lake residents or for ideas on testing your watershed for phosphorus inputs.

OTHER COMMENTS

- Most sites at Lake Skatutakee had lower conductivity levels this summer, with the exception of the Spring Brook (Table 6). This site had only slightly elevated conductivity in July. The lower results for the rest of the watershed indicate that the higher readings from 1999 were caused by the dry weather.
- **Please note** in July this summer the Goose Brook, Outlet, and Spring Brook phosphorus levels were recorded as less than 5 µg/L. The NHDES Laboratory Services adopted a new method of analyzing total phosphorus this year and the lowest value that can be recorded is 'less than 5 µg/L'. We would like to remind the association that a reading of 5 µg/L is considered low for New Hampshire's waters.
- Spring Brook had one of its highest total phosphorus results ever in August (Table 8). It was noted on the field data sheet that there was rain in the previous week, which may have washed excess nutrients into the brook.
- *E. coli* originates in the intestines of warm-blooded animals (including humans) and is an indicator of associated and potentially harmful pathogens. Bacteria concentrations were below the state standard for surface waters at the Spring Brook (Table 12). If residents are concerned about septic system impacts, testing when the water table is high or after rains is best. Please consult the Other Monitoring Parameters section of the report for the current standards for *E. coli* in surface waters.

- We recommend the weed watchers continue to regularly monitor the lake for invasive species.

NOTES

- Monitor's Note (8/15/00): Cold temps week before, some rain

USEFUL RESOURCES

Camp Road Maintenance Manual: A Guide for Landowners. Kennebec Soil and Water Conservation District, 1992. (207) 287-3901

Minimum Shoreland Protection Standards, WD-BB-36, NHDES Fact Sheet. (603) 271-3503 or www.state.nh.us

Bacteria in Surface Waters, WD-BB-14, NHDES Fact Sheet, (603) 271-3503 or www.state.nh.us

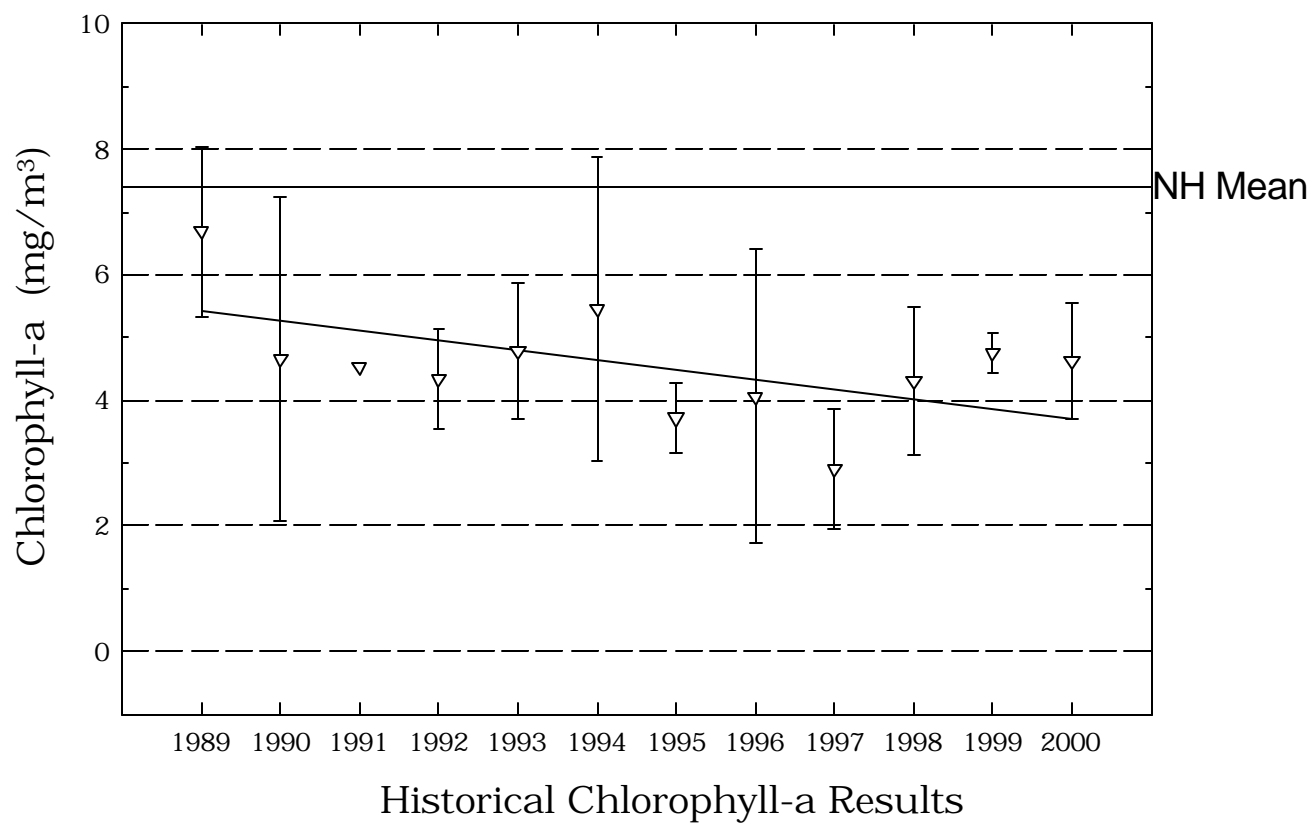
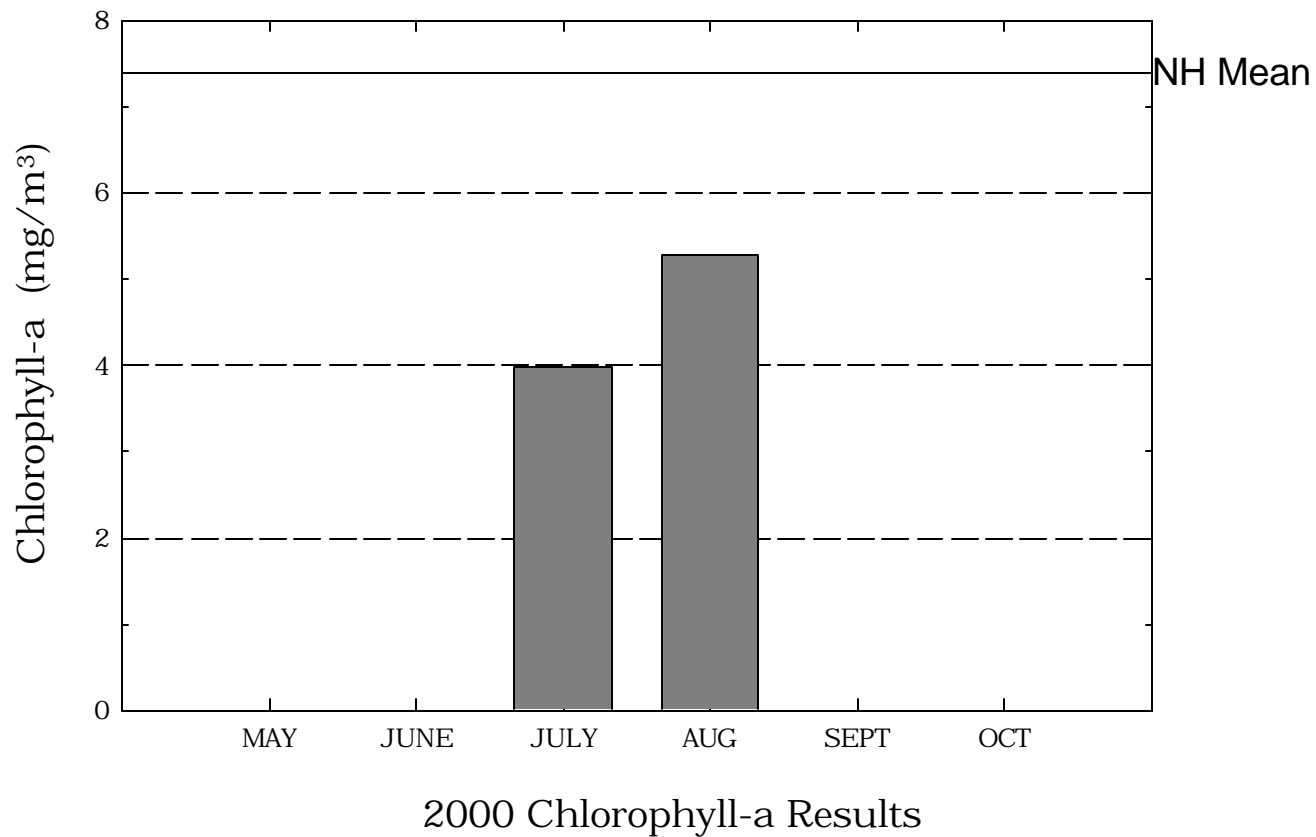
Answers to Common Lake Questions, NHDES-WSPCD-92-12, NHDES Booklet, (603) 271-3503.

Anthropogenic Phosphorus and New Hampshire Waterbodies, NHDES-WSPCD-95-6, NHDES Booklet, (603) 271-3503

The Lake Pocket Book, The Terrene Institute, 2000. (800) 726-5253, or www.terrene.org

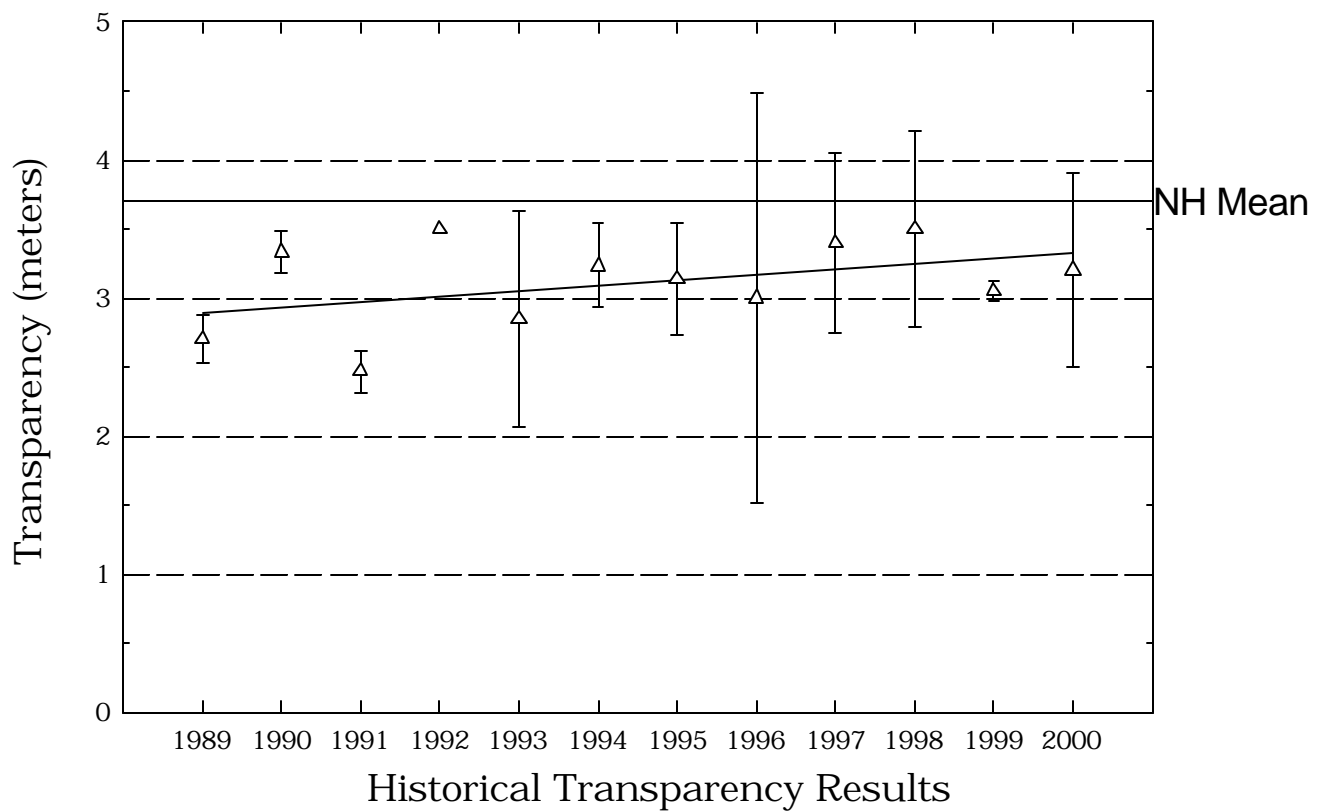
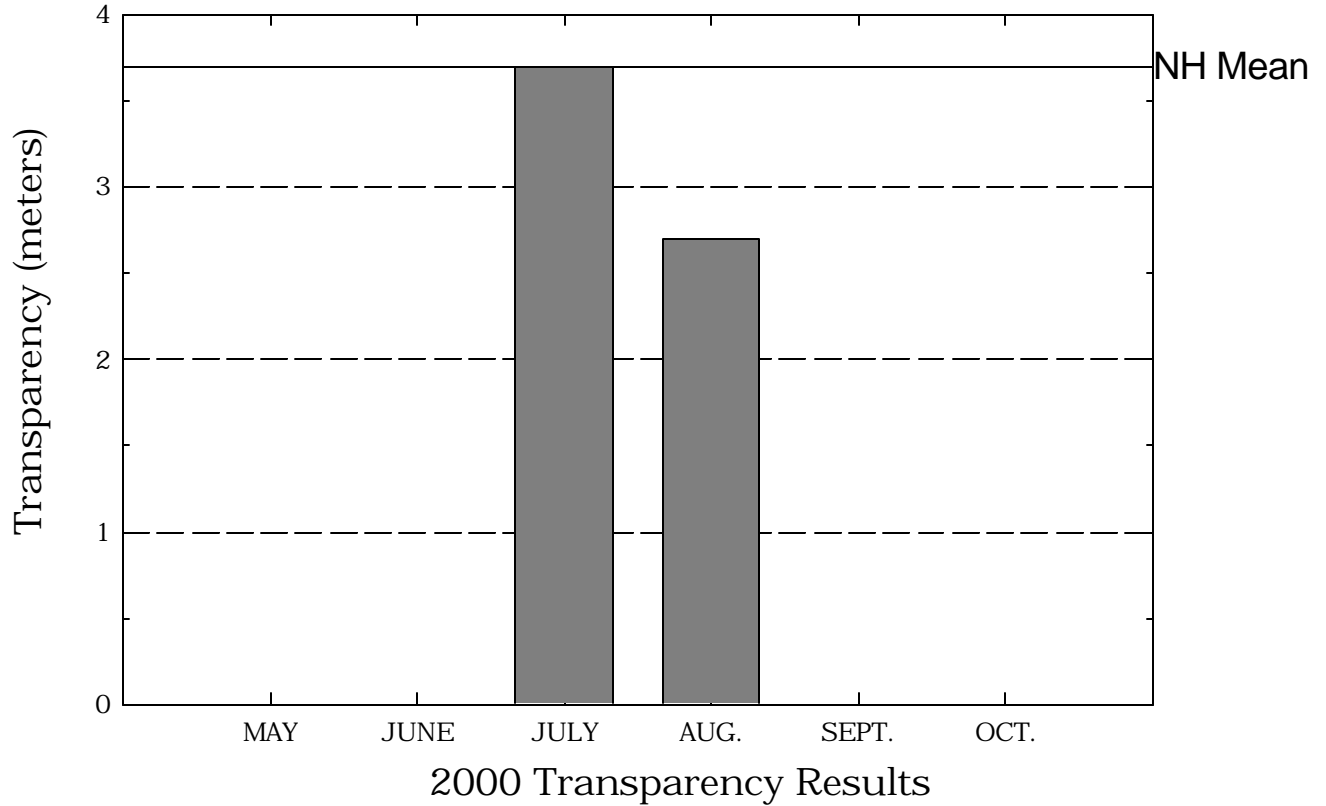
Lake Skatutakee

Figure 1. Monthly and Historical Chlorophyll-a Results



Lake Skatutakee

Figure 2. Monthly and Historical Transparency Results



Lake Skatutakee

Figure 3. Monthly and Historical Total Phosphorus Data.

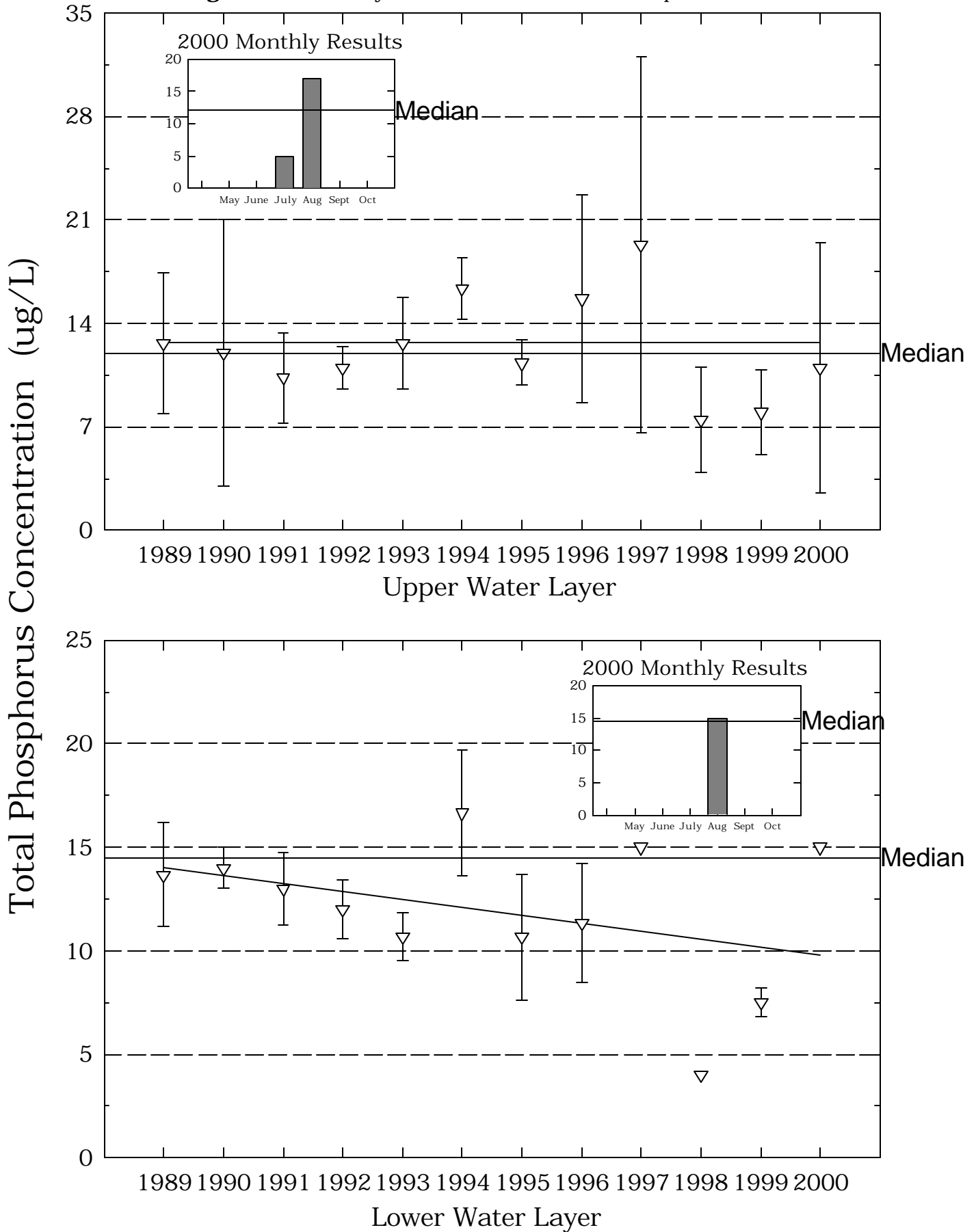


Table 1.**SKATUTAKEE, LAKE
HARRISVILLE****Chlorophyll-a results (mg/m³) for current year and historical
sampling periods.**

Year	Minimum	Maximum	Mean
1989	5.76	8.25	6.69
1990	2.56	7.55	4.65
1991	4.53	6.00	5.26
1992	3.79	4.91	4.35
1993	3.95	6.02	4.78
1994	3.63	8.20	5.46
1995	3.11	4.20	3.71
1996	2.04	6.64	4.06
1997	1.81	3.46	2.90
1998	3.48	5.15	4.31
1999	4.53	4.98	4.75
2000	3.98	5.29	4.63

Table 2.

**SKATUTAKEE, LAKE
HARRISVILLE**

Phytoplankton species and relative percent abundance.

Summary for current and historical sampling seasons.

Date of Sample	Species Observed	Relative % Abundance
08/28/1991	STAURASTRUM	19
	ASTERIONELLA	17
	COELOSPHAERIUM	11
07/22/1992	CHRYSOSPHAERELLA	50
	TABELLARIA	19
	ASTERIONELLA	15
06/24/1993	TABELLARIA	57
	ASTERIONELLA	33
07/14/1994	CHRYSOSPHAERELLA	27
	TABELLARIA	23
	RHIZOLENIA	12
06/14/1995	CHRYSOSPHAERELLA	33
	ASTERIONELLA	31
	DINOBRYON	15
06/13/1996	ASTERIONELLA	88
	TABELLARIA	9
	SYNURA	2
06/30/1997	TABELLARIA	58
	MELOSIRA	16
	ASTERIONELLA	14
07/15/1998	TABELLARIA	72
	ASTERIONELLA	24
	CHRYSOSPHAERELLA	2
08/12/1999	TABELLARIA	74
	DINOBRYON	14
	STAURASTRUM	6
07/13/2000	TABELLARIA	39
	DINOBRYON	36
	ASTERIONELLA	16

Table 3.
SKATUTAKEE, LAKE
HARRISVILLE

**Summary of current and historical Secchi Disk
transparency results (in meters).**

Year	Minimum	Maximum	Mean
1989	2.5	2.8	2.7
1990	3.2	3.5	3.3
1991	2.3	3.4	2.7
1992	3.5	3.5	3.5
1993	2.3	3.4	2.8
1994	2.9	3.5	3.2
1995	2.7	3.5	3.1
1996	2.0	4.7	3.0
1997	2.7	4.0	3.4
1998	3.0	4.0	3.5
1999	3.0	3.1	3.0
2000	2.7	3.7	3.2

Table 4.**SKATUTAKEE, LAKE
HARRISVILLE**

**pH summary for current and historical sampling seasons.
Values in units, listed by station and year.**

Station	Year	Minimum	Maximum	Mean
EPILIMNION	1989	6.19	6.58	6.41
	1990	6.20	6.35	6.27
	1991	6.30	6.74	6.47
	1992	6.48	6.61	6.54
	1993	6.46	6.73	6.57
	1994	6.37	6.62	6.44
	1995	2.96	6.66	3.44
	1996	5.97	7.02	6.21
	1997	6.56	6.69	6.61
	1998	6.36	6.52	6.43
	1999	6.41	6.59	6.49
	2000	6.28	6.37	6.32
GOOSE BROOK	1989	6.11	6.24	6.19
	1990	6.04	6.48	6.20
	1991	6.20	6.32	6.26
	1992	6.31	6.49	6.39
	1993	6.29	6.43	6.36
	1994	6.14	6.44	6.28
	1995	6.26	6.71	6.48
	1996	5.84	6.06	5.96
	1997	5.75	6.38	6.06
	1998	6.01	6.28	6.12
	1999	6.29	6.34	6.31
	2000	6.11	6.18	6.14

Table 4.**SKATUTAKEE, LAKE
HARRISVILLE**

**pH summary for current and historical sampling seasons.
Values in units, listed by station and year.**

Station	Year	Minimum	Maximum	Mean
HYPOLIMNION	1989	6.30	6.44	6.39
	1990	6.26	6.44	6.33
	1991	6.30	6.50	6.39
	1992	6.14	6.57	6.30
	1993	6.35	6.55	6.47
	1994	6.26	6.44	6.33
	1995	6.11	6.58	6.33
	1996	5.69	5.94	5.84
	1997	6.32	6.32	6.32
	1998	6.09	6.09	6.09
	1999	6.41	6.41	6.41
	2000	6.21	6.21	6.21
METALIMNION	1993	6.40	6.62	6.53
	1999	6.25	6.27	6.26
	2000	6.26	6.26	6.26
NORTH BROOK	1989	5.66	5.97	5.74
	1990	5.83	6.10	5.99
	1991	6.10	6.10	6.10
	1992	5.72	6.22	5.90
	1994	6.15	6.15	6.15
	1995	5.92	5.92	5.92
	1996	5.84	5.96	5.90

Table 4.

**SKATUTAKEE, LAKE
HARRISVILLE**

**pH summary for current and historical sampling seasons.
Values in units, listed by station and year.**

Station	Year	Minimum	Maximum	Mean
OUTLET	1989	6.20	6.47	6.34
	1990	6.27	6.51	6.34
	1991	6.30	6.46	6.37
	1992	6.40	6.59	6.48
	1993	6.31	6.49	6.39
	1994	6.23	6.42	6.32
	1995	6.32	6.46	6.40
	1996	6.10	6.55	6.23
	1997	5.96	6.44	6.14
	1998	6.40	6.42	6.41
	1999	6.38	6.54	6.45
	2000	6.18	6.46	6.30
SCOTT'S	1995	6.56	6.56	6.56
SPRING BK UPPER	1992	6.76	6.76	6.76
SPRING BROOK SPRING	1993	5.99	5.99	5.99
	1996	5.86	5.86	5.86
SPRING BROOK	1989	6.70	6.95	6.82
	1990	6.69	6.80	6.73
	1991	6.70	6.84	6.76

Table 4.**SKATUTAKEE, LAKE
HARRISVILLE**

pH summary for current and historical sampling seasons.
Values in units, listed by station and year.

Station	Year	Minimum	Maximum	Mean
	1992	6.55	6.59	6.57
	1993	5.86	6.85	6.25
	1994	5.88	6.67	6.15
	1995	6.62	6.78	6.67
	1996	5.79	6.55	6.14
	1997	6.67	6.80	6.73
	1998	6.58	6.79	6.67
	1999	6.58	6.64	6.61
	2000	6.56	6.73	6.64
SPRING	1998	5.82	5.82	5.82

Table 5.**SKATUTAKEE, LAKE****HARRISVILLE****Summary of current and historical Acid Neutralizing Capacity.****Values expressed in mg/L as CaCO₃.****Epilimnetic Values**

Year	Minimum	Maximum	Mean
1989	1.90	2.20	2.07
1990	0.70	1.90	1.43
1991	0.70	2.30	1.50
1992	2.20	2.60	2.40
1993	1.50	3.00	2.20
1994	1.70	2.40	1.97
1995	1.90	1.90	1.90
1996	1.20	2.10	1.77
1997	1.50	2.30	2.03
1998	1.80	2.30	2.05
1999	2.20	2.50	2.35
2000	1.90	2.40	2.15

Table 6.

**SKATUTAKEE, LAKE
HARRISVILLE**

**Specific conductance results from current and historic
sampling seasons. Results in uMhos/cm.**

Station	Year	Minimum	Maximum	Mean
EPILIMNION	1989	34.5	43.1	37.9
	1990	29.1	36.1	33.6
	1991	34.8	38.9	36.8
	1992	38.0	40.3	39.1
	1993	41.5	45.7	43.2
	1994	37.3	39.5	38.5
	1995	40.1	332.0	137.9
	1996	33.0	36.6	35.2
	1997	37.3	40.0	38.2
	1998	31.1	32.1	31.6
	1999	39.9	40.4	40.1
	2000	35.3	35.9	35.6
GOOSE BROOK	1989	28.1	36.7	31.0
	1990	24.3	31.8	27.8
	1991	26.0	34.5	30.2
	1992	29.3	31.1	30.2
	1993	32.3	34.3	33.5
	1994	28.1	34.1	31.2
	1995	30.2	33.5	31.4
	1996	24.6	46.2	32.3
	1997	27.0	30.3	28.3
	1998	24.6	27.7	26.2
	1999	28.8	30.7	29.7
	2000	25.6	30.4	28.0

Table 6.

**SKATUTAKEE, LAKE
HARRISVILLE**

**Specific conductance results from current and historic
sampling seasons. Results in uMhos/cm.**

Station	Year	Minimum	Maximum	Mean
HYPOLIMNION	1989	35.0	42.9	38.3
	1990	29.2	36.7	33.7
	1991	34.3	39.1	36.7
	1992	38.9	39.7	39.3
	1993	42.5	42.6	42.5
	1994	38.0	40.3	39.2
	1995	41.5	43.0	42.1
	1996	33.0	36.6	34.9
	1997	36.6	36.6	36.6
	1998	31.4	31.4	31.4
	1999	39.6	40.4	40.0
	2000	33.9	33.9	33.9
METALIMNION	1993	42.0	43.0	42.6
	1999	39.9	40.6	40.2
	2000	34.6	34.6	34.6
NORTH BROOK	1989	23.2	25.1	24.0
	1990	21.1	23.8	22.2
	1991	22.9	22.9	22.9
	1992	22.5	25.2	23.8
	1994	24.5	24.5	24.5
	1995	23.3	23.3	23.3
	1996	21.9	24.0	22.9

Table 6.**SKATUTAKEE, LAKE****HARRISVILLE**

**Specific conductance results from current and historic
sampling seasons. Results in uMhos/cm.**

Station	Year	Minimum	Maximum	Mean
OUTLET	1989	34.0	41.2	36.8
	1990	28.6	34.8	32.7
	1991	34.9	36.0	35.4
	1992	37.6	40.9	39.2
	1993	40.9	42.5	41.6
	1994	36.2	38.4	37.5
	1995	41.0	41.9	41.4
	1996	32.1	35.5	34.3
	1997	35.5	37.2	36.3
	1998	30.0	30.7	30.3
	1999	38.4	40.2	39.3
	2000	35.1	35.4	35.2
SCOTT'S	1995	41.1	41.1	41.1
SPRING BK UPPER	1992	98.8	98.8	98.8
SPRING BROOK SPRING	1993	99.0	99.0	99.0
	1996	97.2	97.2	97.2
SPRING BROOK	1989	93.2	94.9	94.1
	1990	97.6	100.8	99.1
	1991	95.9	101.8	98.8
	1992	95.8	96.6	96.2

Table 6.**SKATUTAKEE, LAKE
HARRISVILLE****Specific conductance results from current and historic
sampling seasons. Results in uMhos/cm.**

Station	Year	Minimum	Maximum	Mean
	1993	94.7	99.4	96.3
	1994	94.8	99.3	97.1
	1995	88.5	92.2	90.3
	1996	92.3	96.8	94.0
	1997	91.6	93.0	92.2
	1998	91.7	95.6	93.7
	1999	98.5	98.6	98.5
	2000	101.6	106.7	104.1
SPRING	1998	100.2	100.2	100.2

Table 8.**SKATUTAKEE, LAKE****HARRISVILLE**

**Summary historical and current sampling season Total
Phosphorus data. Results in ug/L.**

Station	Year	Minimum	Maximum	Mean
EPILIMNION	1989	9	18	12
	1990	3	21	12
	1991	7	13	10
	1992	10	12	11
	1993	10	16	12
	1994	14	18	16
	1995	10	13	11
	1996	9	23	15
	1997	11	34	19
	1998	5	10	7
	1999	6	10	8
	2000	5	17	11
GOOSE BROOK	1989	11	12	11
	1990	9	16	11
	1991	8	17	12
	1992	7	12	9
	1993	8	10	9
	1994	11	14	12
	1995	5	8	7
	1996	9	13	11
	1997	7	14	11
	1998	7	11	9
	1999	3	9	6

Table 8.**SKATUTAKEE, LAKE****HARRISVILLE**

**Summary historical and current sampling season Total
Phosphorus data. Results in ug/L.**

Station	Year	Minimum	Maximum	Mean
HYPOLIMNION	2000	< 5	10	7
	1989	11	16	13
	1990	13	15	14
	1991	11	14	13
	1992	11	13	12
	1993	10	12	10
	1994	14	20	16
	1995	8	14	10
	1996	8	13	11
	1997	15	15	15
	1998	4	4	4
	1999	7	8	7
	2000	15	15	15
METALIMNION	1993	12	14	13
	1999	5	7	6
	2000	16	16	16
NORTH BROOK	1989	1	5	3
	1990	5	85	33
	1991	7	9	8
	1992	4	6	5
	1994	11	11	11
	1995	5	5	5
	1996	5	9	7

Table 8.**SKATUTAKEE, LAKE****HARRISVILLE**

**Summary historical and current sampling season Total
Phosphorus data. Results in ug/L.**

Station	Year	Minimum	Maximum	Mean
OUTLET	1989	7	10	8
	1990	8	10	9
	1991	8	15	11
	1992	7	8	7
	1993	7	12	9
	1994	11	14	12
	1995	8	15	11
	1996	8	11	9
	1997	9	18	13
	1998	2	10	6
	1999	7	7	7
	2000	< 5	13	9
SCOTT'S	1995	11	11	11
SPRING BK UPPER	1992	6	6	6
SPRING BROOK SPRING	1993	3	3	3
	1996	5	5	5
SPRING BROOK	1989	2	13	6
	1990	6	15	9
	1991	7	10	9
	1992	5	5	5

Table 8.

SKATUTAKEE, LAKE

HARRISVILLE

**Summary historical and current sampling season Total
Phosphorus data. Results in ug/L.**

Station	Year	Minimum	Maximum	Mean
	1993	4	5	4
	1994	3	8	6
	1995	6	19	13
	1996	5	14	9
	1997	6	8	6
	1998	4	6	5
	1999	3	6	4
	2000	< 5	19	12

Table 9.
SKATUTAKEE, LAKE
HARRISVILLE

Current year dissolved oxygen and temperature data.

Depth (meters)	Temperature (celsius)	Dissolved Oxygen (mg/L)	Saturation (%)
July 13, 2000			
0.1	22.3	8.0	91.7
1.0	21.8	8.1	92.6
2.0	21.7	8.1	91.7
3.0	21.6	8.1	91.5
4.0	21.6	7.9	89.8
5.0	21.6	7.8	88.0

Table 10.**SKATUTAKEE, LAKE
HARRISVILLE****Historic Hypolimnetic dissolved oxygen and temperature data.**

Date	Depth (meters)	Temperature (celsius)	Dissolved Oxygen (mg/L)	Saturation (%)
June 3, 1989	5.0	16.8	9.2	93.0
June 3, 1990	5.0	16.0	10.2	103.6
August 28, 1991	5.0	21.8	8.4	96.3
July 22, 1992	5.0	21.4	3.5	39.8
June 24, 1993	5.0	19.5	8.5	91.0
July 14, 1994	5.0	23.5	7.3	85.0
June 14, 1995	5.0	18.7	8.5	89.0
June 13, 1996	5.0	18.0	7.0	74.0
June 30, 1997	5.0	23.0	5.7	66.0
July 15, 1998	5.0	20.4	5.4	59.0
August 12, 1999	6.0	21.9	1.4	15.8
July 13, 2000	5.0	21.6	7.8	88.0

Table 11.

**SKATUTAKEE, LAKE
HARRISVILLE**

**Summary of current year and historic turbidity sampling.
Results in NTU's.**

Station	Year	Minimum	Maximum	Mean
EPILIMNION	1997	0.4	1.2	0.7
	1998	0.4	1.2	0.8
	1999	0.5	0.5	0.5
	2000	0.4	0.6	0.5
GOOSE BROOK	1997	0.1	0.4	0.2
	1998	0.5	1.0	0.7
	1999	0.2	0.5	0.3
	2000	0.2	0.4	0.3
HYPOLIMNION	1997	0.6	0.6	0.6
	1998	0.5	0.5	0.5
	1999	0.5	0.7	0.6
	2000	0.5	0.5	0.5
METALIMNION	1999	0.6	0.7	0.6
	2000	0.6	0.6	0.6
OUTLET	1997	0.3	0.4	0.4
	1998	0.3	0.5	0.4
	1999	0.3	0.4	0.3
	2000	0.2	0.3	0.3
SPRING BROOK	1997	0.0	1.9	0.6
	1998	0.0	0.9	0.4

Table 11.

**SKATUTAKEE, LAKE
HARRISVILLE**

**Summary of current year and historic turbidity sampling.
Results in NTU's.**

Station	Year	Minimum	Maximum	Mean
SPRING	1999	0.3	0.3	0.3
	2000	0.2	0.6	0.4
	1998	1.4	1.4	1.4

Table 12.

**SKATUTAKEE LAKE
HARRISVILLE**

**Summary of current year bacteria sampling.
Results in counts per 100ml.**

Location	Date	E. Coli <small>See Note Below</small>
SPRING BROOK	August 15	113